

BRILL MAGAZINE



The October Convention Exhibit

THE BRILL EXHIBIT at the Railway-Appliance Exposition held in connection with the American Electric Railway Association Convention at the Million Dollar Pier, Atlantic City, October 12-16, will be conspicuously located at the left of the Main Building, near main entrance, as in former years.

The latest types of Radiax and double-motor pivotal trucks will be shown, and a number of new developments in car seats and other equipment are worthy of thorough investigation. The Exhibit Committee's plans for the Exposition are remarkably complete and forward as usual, assuring a comprehensive and attractive representation of the advances made in all classes of electric railway equipment during the present year. The adequate and attractive reception arrangements of the Brill Exhibit Spaces are welcome to all.

THE J. G. BRILL COMPANY
PHILADELPHIA, PENNSYLVANIA

DEC 4 1916

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Conscientiousness

Somewhere in the make-up of every man is a faculty intended to serve as an automatic controller of conduct, setting it in motion, regulating it, and holding it in check.

This faculty is known by several names—conscience, moral instinct, ethical perception—each meaning the same impelling, compelling, repelling force, to be used or not, according as a man wills.

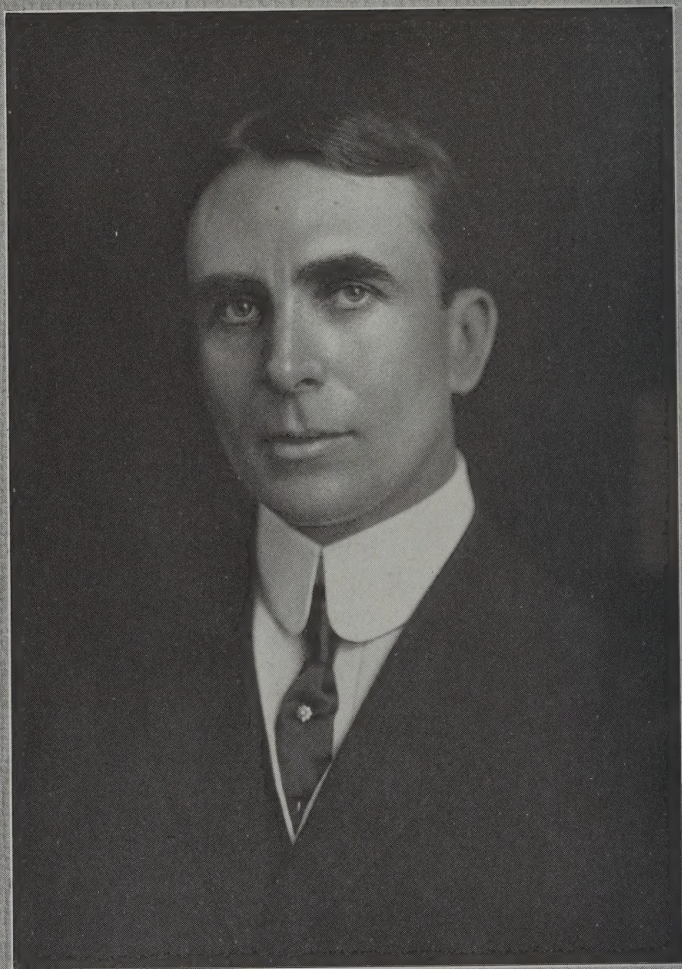
It is the factor in a man's life having most to do with the development of what is beneath the surface—his character—and also of what is seen or known of him—his reputation.

The conscientious man is under his own imperative command and obligation to do what is right, to resist what is wrong, and is thereby fitted to command and control others.

Conscientiousness at the head of an organization, permeates to and through every department and individual, engendering and securing high standards of conduct.

Conscientiousness is the prime qualification necessary to the establishment of confidence, and is more and more recognized as a power and not a weakness in the character of men who deal with the public.

Conscientiousness in dealing with the public produces a public conscience—a spirit of fairness—resulting in confidence and co-operation.



Leonard T. Busby.

PRESIDENT, CHICAGO SURFACE LINES

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Leonard A. Busby



LEONARD A. BUSBY, President of the recently organized Chicago Surface Lines, was born in Jewett, Ohio, 1869. He was educated in public schools, and in 1894 graduated from Ohio Wesleyan University (first honor man); graduated from Northwestern University Law School in June, 1895, and began his professional career as a law clerk in the offices of Lyman & Jackson the same year. Three years later Mr. Busby became a member of the firm and continued the general practice of law until 1906, when he became counsel for the receiver of the Calumet Electric Street Railway Company, Chicago. In 1908 he was appointed counsel for the Calumet & South Chicago Railway Company, and in 1910 counsel for the Chicago City Railway Company and the various lines controlled by the Chicago City and Connecting Railways Collateral Trust. During the year 1913 he conducted the negotiations with the City of Chicago for an operating merger of all of the surface lines in the city. The result of these negotiations was embodied in the so-called "Unification Ordinance," passed by the City Council November 13, 1913, and made effective February 1, 1914. The new organization, embracing all of the surface street railways in the City of Chicago, is known as the "Chicago Surface Lines," of which Mr. Busby was elected President in January and assumed his duties as the chief executive February 1, 1914. He is a member of the Chicago Club, Mid-Day Club, and the Law Club of the City of Chicago, and is one of the trustees of the John Crerar Library.

Conditions Which Govern the Type of Car for City Service

Omaha, Nebraska

THE wide brown waters of the Missouri River form the eastern boundary of the State of Nebraska, and extends in a northwesterly direction for a distance of over 300 miles. Nearly halfway up the boundary is the city of Omaha, the metropolis of the State, and directly opposite, connected by bridges, is the city of Council Bluffs, in the State of Iowa. The land which formed the original town site of Omaha is an elongated and elevated river terrace now given over entirely to business; behind this are hills and bluffs over which the residential districts have extended. From a population in 1880 of 30,500, it has today 135,000, which, with the population of South Omaha of 35,000, that of Council Bluffs of 35,000, and about 10,000 in several suburbs, gives the lines of the Omaha & Council Bluffs Street Railway Company a tributary population of about 225,000.

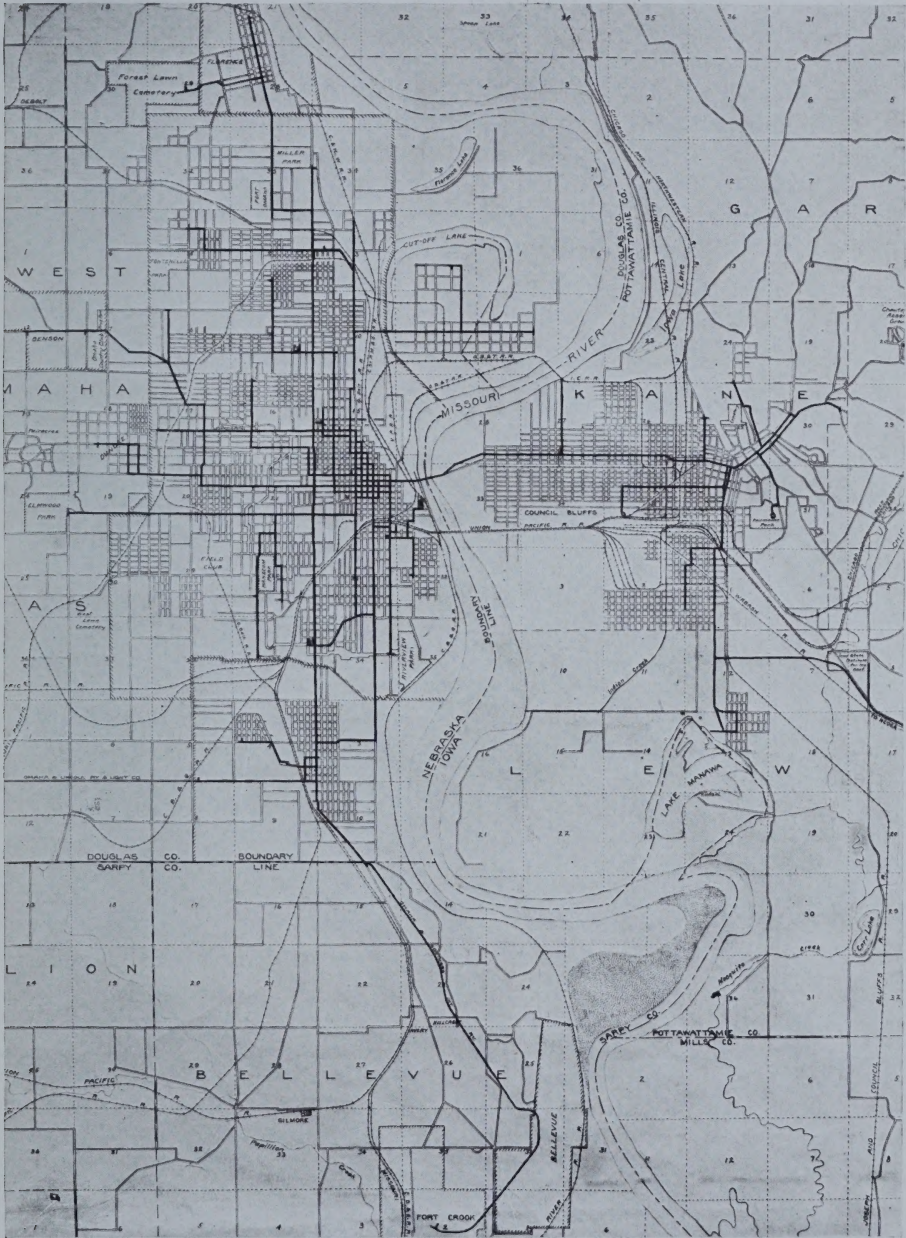
Omaha, which was named from the Omaha Indians, passed through various vicissitudes from 1825, when it was a licensed Indian post, to 1857, when it received its charter as a city. Till 1867, it was the capital of the territory, and since 1887 it has been the only city in the state governed under

the general charter for metropolitan cities. Its location and business activity secured the city large freighting interests and gave it an initial start over the other cities of the state. Three great railway systems entered the city in the years 1867-8, and today Omaha has outlets over nine grand trunk railways—the Chicago, Burlington & Quincy, the Union Pacific, the Chicago, Rock Island & Pacific, the Chicago Great-Western, the Chicago & Northwestern, the Chicago, Milwaukee & St. Paul, the Illinois Central, the Missouri Pacific and the Wabash.

While the meat packing industry began as early as 1871, and became an important factor in the business growth of Omaha, it was greatly advanced by the removal of the Union stockyards in 1884 to what is now South Omaha. Among its principal manufacturing establishments are breweries and distilleries, silver and lead smelting and refining works, railway shops, flour and grist mills and dairies.

One of the most successful expositions ever held in this country was the Trans-Mississippi Exposition, illustrating the progress and resources of the states west of the Mississippi, held here in 1898.

Omaha is well provided with



OMAHA TRAFFIC CONDITIONS AND CARS. Map showing the lines of the Omaha & Council Bluffs Street Railway Company on both sides of the Missouri River. Note the loop system at the business centre, which provides unusual routing facilities for single-end-operated cars.

educational institutions, including a university, departments of State University, a state school for the deaf, several colleges and high schools and a public library. It also has a number of hospitals, and many churches and other religious and philanthropic institutions. Among its newspapers are several

struck by a tornado which wrought havoc diagonally across a residential part of the city for a distance of five miles and several blocks wide. Although heavy rains followed the tornado and ended with a snowstorm, the railway company cleared the wreckage on the lines in the track of



OMAHA TRAFFIC CONDITIONS AND CARS. Intersection of 24th and Cumings Streets, an important transfer point on the system.

of wide influence throughout the west. The city is the headquarters of the United States Military Department of the Missouri. At Fort Omaha, near the northern city line, there is a signal corps and a station for experiments with war balloons. Fort Crook is a large infantry post 10 miles south of the city.

In March, 1913, Omaha was

the tornado in remarkably short time and escaped with a comparatively small replacement expense.

The street railway system of Omaha had its beginning in a two-mile horse-car line in 1867, and developed slowly and through many difficulties through 30 years of its history. Several systems which had come into existence were eventually consolidated, and the

lines were electrified during the period of 1893-6. Not until the year of the Trans-Mississippi Exposition, 1898, did the lines yield a fair income, and in 1902 a stable condition of affairs was secured through the consolidation of the Omaha and Council Bluffs Bridge lines, which brought the present

the old cars replaced with large double-truck equipment. Among the later buildings is a double-deck carhouse of reinforced concrete construction which has a capacity of 85 cars and includes spacious trainmen's quarters and offices. This building was completed about two years ago.



OMAHA TRAFFIC CONDITIONS AND CARS. Fourteenth and Douglass Streets

organization, The Omaha & Council Bluffs Street Railway Company, into existence. In the following years a new central power station and new sub-stations were built, large carhouses and shops were erected, a considerable number of lines double-tracked and many extensions made, heavier rails of the girder type were installed, the overhead rebuilt, and

All the lines in the cities of Omaha and Council Bluffs are owned or controlled by the Omaha & Council Bluffs Street Railway Company, and consist of 160 miles of standard gage track, 29 miles of which are single-track, and 65½ miles are double-track. The radius of the shortest curve is 35 feet. The Omaha & Southern Interurban Railway, which connects



OMAHA TRAFFIC CONDITIONS AND CARS. Twenty-fourth Street and Ames Avenue.



OMAHA TRAFFIC CONDITIONS AND CARS. Burlington Street, with Union Depot on the right.

South Omaha, Bellevue, and Fort Crook, is under the same management. The layout of the lines in the two cities is shown in the accompanying map, and it is interesting to note the regularity of the street arrangement and the comprehensive scheme of the railway system in spite of the hilly

maximum grade being as steep as 12 per cent.; the streets, however, are wide and fair speeds are attainable on many parts of all lines outside the business area. Double-trucks and four-motor equipments are therefore used under cars operated on divisions of the railway system having the heavier



OMAHA TRAFFIC CONDITIONS AND CARS. The Stock Exchange Building in South Omaha; the Union Stock Yards are nearby.

character of the land. A very adequate loop system in the business section permits the use of single-end-operated cars, and the terminals of all lines are provided with wyes, with a few exceptions where loops are installed. Many of the grades are severe, and range from 5 to 10 per cent., the

grades and single-motor trucks with two motors per car on the other lines.

For the normal daily service of the lines, 260 cars are required, and there are 350 cars available for maximum daily service during the rush-hour periods, which occur between 6.30 and 8.00 A. M., and

5.00 and 6.15 P. M. Of these 350 cars, 138 are of the type illustrated, which is the latest standard of the system. Some of the cars in operation are similar to the standard type, but have longitudinal seats and are mounted on an older type of single-motor

During the year 1913, 55,030,638 revenue passengers were carried and 16,739,701 transfer passengers; the car mileage for the year was 10,134,108.

The standard type of car on the lines has been carefully developed and is the outgrowth of former



OMAHA TRAFFIC CONDITIONS AND CARS. Both rear doors slide into pockets in narrow bulkhead. Seating capacity, 38

truck; there are also a number of steel trail cars operated on certain of the lines during the peak load periods. At Sixteenth and Farnam Streets, in the heart of the business district, cars pass at the rate of 60 per hour during the heavy traffic periods. The prepayment method of fare collection is used and transfers are issued.

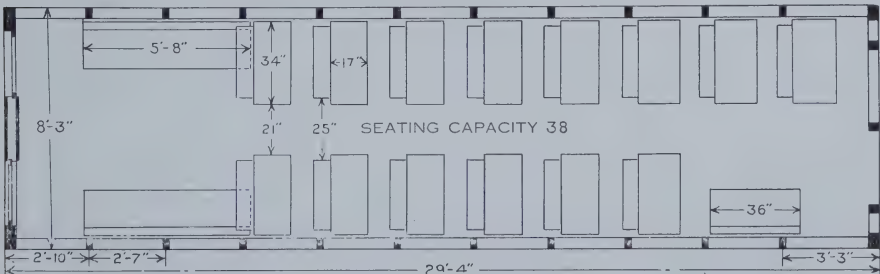
equipment. The prepayment method of fare collection was first put in operation on the system in 1909, and is provided for in the latest type of cars by a 6-ft. 8-in. rear platform, having a pipe railing extending from a stanchion, at the center of the 5-ft. 5-in. step, around to the far side of the narrow central bulkhead. The position



OMAHA TRAFFIC CONDITIONS AND CARS. Standard car of the system. Mounted on Brill No. 27-GE1 trucks having wheel base of 4 ft. 6 in.

of the conductor and fare box is within this railing, back of the bulkhead; the bulkhead serves as a pocket for the sliding entrance and exit doors at each side. This platform is vestibuled and is enclosed on the devil-strip side, but is not provided with doors at the step. The diagram below shows the seating plan for 38 passengers, and gives the general dimensions of the body. At the front

end, the platform is 5 ft. long, and has a 3-ft. 0 $\frac{1}{2}$ -in. step. The exit from the carbody to the front platform is not provided with a door, as the heater is located on this platform. Two-leaf folding doors, operated from the motorman's position by a simple lever system, are hinged at either side and open outwardly; the stationary step is covered by inclined guards attached to the lower part of the doors.



OMAHA TRAFFIC CONDITIONS AND CARS. Height, track to side sills, 2 ft. 8 $\frac{1}{2}$ in.; side sills over trolley boards, 9 ft. 1 $\frac{1}{2}$ in.; floor to centre of headlining, 8 ft.; track to step, 16 $\frac{1}{2}$ in.; step to platform, 13 $\frac{1}{4}$ in.; platform to floor, 10 in. Weight of body, less equipment, 18,200 lb.; air and electric equipment, 2,600 lb.

Step heights at front and rear platforms are, $16\frac{1}{2}$ in. from rail to top of tread, from tread to platform $13\frac{3}{4}$ in., from platform to carfloor 10 in. All the windows in the body and platforms have stationary upper sashes and lower sashes arranged to drop into covered pockets; cherry is used for the interior finish of the car and for sashes and doors. Other details, such as the lighting arrangement, ventilating, route and destination signs, etc., are clearly shown in the engravings.

The carbodies are built on wooden underframes, having 5 by 6-in. side sills and $3\frac{1}{2}$ by $5\frac{7}{8}$ -in. crossings. The side sills are reinforced by 8 by $\frac{5}{8}$ -in. outside plates and have an additional reinforcement consisting of angles at the bolsters extending to the corner posts and to similar distance from the bolster toward the center of the car. Inside truss rods

are anchored through the end sills and raised to the height of 1 ft. 6 in. on the second side post, where they are brought over strong steel supports, thus giving substantial reinforcement to the overhang; the centers of the sills are braced by $1\frac{1}{8}$ -in. truss rods, with $10\frac{1}{2}$ -in. queen posts. Tie rods, $1\frac{1}{4}$ by $\frac{1}{4}$ in., extend through the corner posts along each side under the belt rail; the side posts are $2\frac{3}{8}$ in. thick, and the corner posts, $4\frac{1}{4}$. The platforms at both ends are supported on Z-bar outside knees and angles at the center.

The standard trucks of the lines are the Brill 27-GE1 type of double-motor truck, and the Brill 39-E type of single-motor truck. Both types of truck have a wheel base of 4 ft. 6 in.; the double-motor truck is equipped with motors of 32 hp. capacity and the single-motor truck of 35 and 40 hp. capacity.

Equipment for New Bus Line in Birmingham, Alabama

One-Man Prepayment Operation

THE Birmingham Realty Company, of Birmingham, Ala., a few months ago purchased four 15-ft. 6-in. omnibus bodies from The J. G. Brill Company as a means of increasing the transportation facilities to their Norwood property, a highly developed residential section situated about three and

one-quarter miles from the center of the city. During the short period the busses have been in operation they have given complete satisfaction to the company and have become very popular with patrons on account of affording quick, clean and noiseless transportation; the route traversed is over asphalt streets.

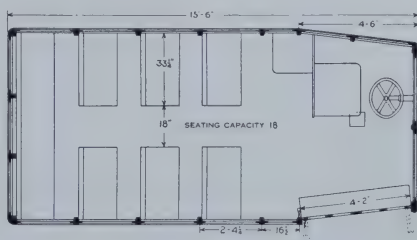
The operation of the busses is



OMNIBUSES FOR BIRMINGHAM, ALA. The stanchion at the center of the doorway separates colored and white passengers in entering and leaving. Mounted on two-ton Pierce-Arrow Chassis.

on the one-man prepayment method. The 4-ft. 2-in. door opening on the forward right-hand side is the only means of entrance and exit. This is rather large, considering the size of the body, but it is necessary, owing to a State ordinance which prohibits white and colored persons entering and leaving a public conveyance through one and the same opening, although there is nothing to prohibit them sitting together if they desire. Therefore, the door opening is divided by a pipe stanchion extending from the top step to the top panel, and each class uses its separate door opening for both entrance and exit. The door opening is enclosed by two manually operated double-leaf folding doors, which close in conjunction with the single folding step. In addition to operating the doors, the driver also attends to the collection of

fares, with the aid of a fare-box located beside his seat, as shown in the above illustration. The roof is the standard plain-arch type, and is equipped with two ventilators, one at each end, located in the top panel. There are also two windows in the front end, the one directly in front of the driver being provided with a stationary weather shield. The sashes throughout are of the two-part type, the upper being sta-



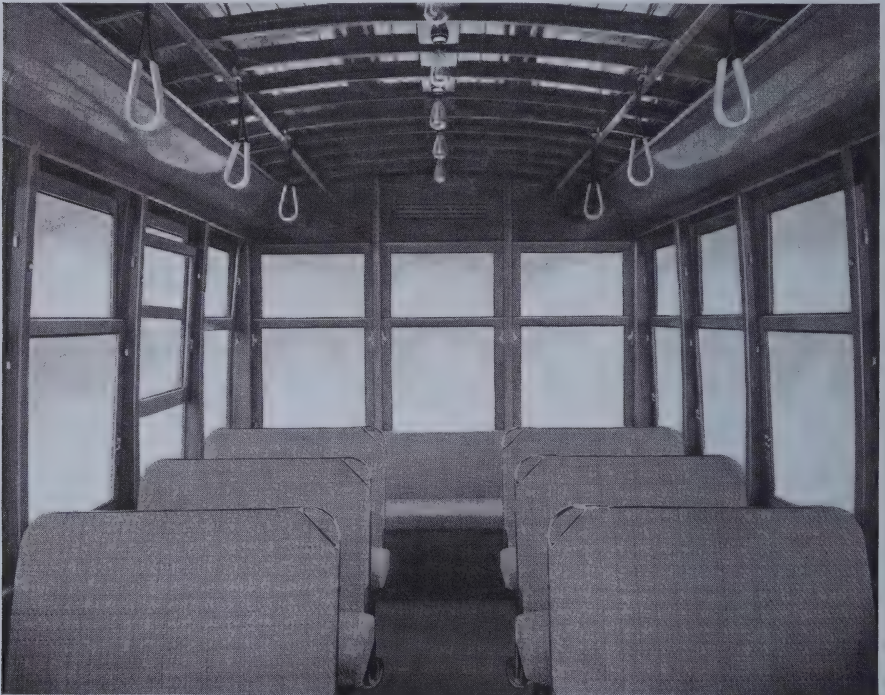
OMNIBUSES FOR BIRMINGHAM, ALA. Height, street to side sill, 2 ft. 9 1/2 in.; sill over roof boards, 6 ft. 11 1/2 in.; floor to ceiling, 6 ft. 9 in.; street to step, 14 1/4 in.; step to platform, 10 in.; platform to floor 10 in. Weight of body, including equipment, 2,600 lb.; weight of chassis, 5,600 lb.

tionary and the lower arranged to raise. The interior is finished in ash, natural finish, with bronze metal trimmings; the ceiling has a carline finish with roof boards showing. Transverse seats, three on each side, are of the Brill stationary back type with $33\frac{1}{4}$ -in. cushions; there is a single seat against the driver's partition, and a full-width seat at the rear end; all these seats are upholstered in Brill twill-woven rattan, and provide a seating capacity of 18, which is the number for this size and weight of body. The driver's seat is upholstered in leather. The two-ton Pierce-Arrow chassis has a wheel base of 15 ft., and the wheels are

36 in. in diameter. The body weighs 2,600 lbs., and the chassis 5,600 lbs.

The underframe is of Brill standard construction and built entirely of ash. The side sills are $2\frac{1}{4}$ by 4 in.; the front end sill $1\frac{3}{4}$ by 4 in.; the rear end sill $1\frac{3}{4}$ by $5\frac{1}{2}$ in.; there are three cross-ings $1\frac{3}{8}$ by 3 in., and four $1\frac{3}{8}$ by $1\frac{3}{4}$ in.; the latter attached to 3-in. channels form furring to which the floor boards are attached.

The corner and side posts in the upper framing are also of ash, $3\frac{1}{2}$ by $1\frac{1}{2}$ in., respectively. The entire construction and equipment are modern, and the busses present an excellent appearance.



OMNIBUSES FOR BIRMINGHAM, ALA. Natural ash finish. Lower sashes raise and upper are stationary.

Steam Cars for South American Railway

First- and Third-Class Passenger Service

AMONG the latest foreign shipments of the Wason Manufacturing Company is a lot of cars of the types illustrated, for the Ferrocarril del Pacifico, of Colombia. This railroad is of recent construction and is one of the most important in the Republic, as it provides the only railway connection between the capital, Bogota, and the coast. The western terminus of the line is Buena Ventura, the chief city of the west coast of Colombia, on Choca Bay, about four hundred miles south of Panama. Three rugged and high mountain ranges, the Cordillera, extend north and south throughout this part of the country; Bogota is situated on the western slope of the eastern range. From Bogota to Girardot, on the Magdalena River, a distance of about 75 miles, the company's trains use the tracks of the Colombian National Railway. In crossing the central Cordillera, a height of over 5,000 feet is reached, after which the line extends for a considerable distance through the Cauca Valley at a height of over 3,000 feet, and then descends a long gradient to the coast. From Bogota to Buena Ventura, the distance, which in a straight line is about three hundred miles, by rail is 362 miles. Rich gold and copper mining districts are reached

by the line, and there are excellent shipping facilities from the large harbor at Buena Ventura.

Both first and third-class cars are built on the same type of underframe, which is made up of 7-in. channel side sills, center sills of 7-in. I-beams, and intermediate sills of 6-in. I-beams. The center and intermediate sills extend through to the platform end piece and the side sills connect with the body end sills. There are four 4-in. channel cross braces, which are riveted to all sills. Needle beams are riveted to the sills with $\frac{1}{4}$ -in. gusset plates. These needle beams are made of 6-in. I-beams. Built up bolsters are employed, the top member being 8 by $\frac{7}{8}$ in., and the bottom member 8 by 1 in.; the plates are machined and accurately fitted. Truss rods of wrought iron $1\frac{1}{4}$ in. in diameter, with ends upset to $1\frac{1}{2}$ in., reinforce the side sills.

The side construction of both types of cars is the same, and consists of two diagonal braces between each pair of posts, the braces being secured at the top by hook bolts, which are brought through the side sills and have nuts and washers for tightening if required. This relieves the belt railing of strain and furnishes a convenient means of tightening joints which may be affected by the extremes of climate encountered on



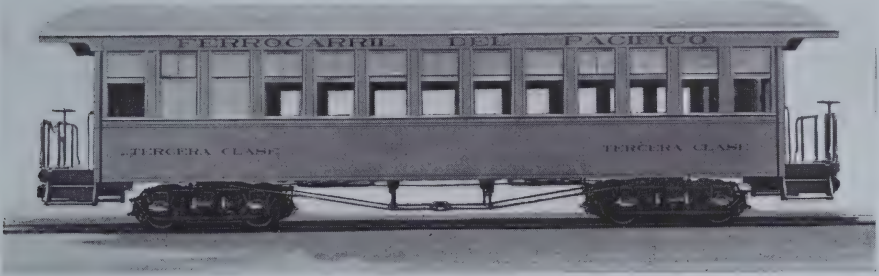
STEAM CARS FOR SOUTH AMERICAN RAILROAD. First-class type. Mounted on Wason Trucks of standard design. Built for 3 ft. gage track.

the lines. Tie rods are also furnished at each post, extending through both top plate and side sill. The roofs differ, in that the first-class cars have the monitor

type and the third-class have the plain arch. The interior of the first-class cars is of clear red oak throughout, and the ceiling is of composition board; the doors and



STEAM CARS FOR SOUTH AMERICAN RAILROAD. Interior of first-class type. Red oak finish throughout. Toilet compartment located at each end.



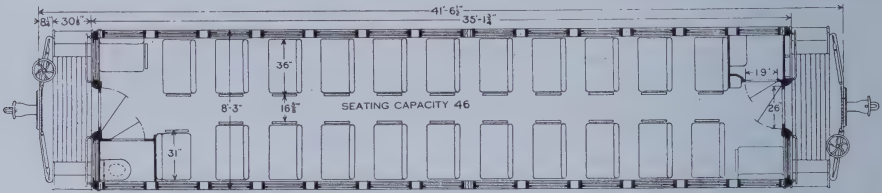
STEAM CARS FOR SOUTH AMERICAN RAILROAD. Third-class type. Mounted on Wason Trucks of standard design.

sashes are also of red oak. Twill-woven cane upholstered seats, 36 in. long, and having 19-in. backs, furnish a seating capacity of 46. Toilet rooms are provided at each

end. The third-class cars have earline finished ceilings, and the interior woodwork is sheathed in pine and with ash doors and windows. Wooden slat seats are used

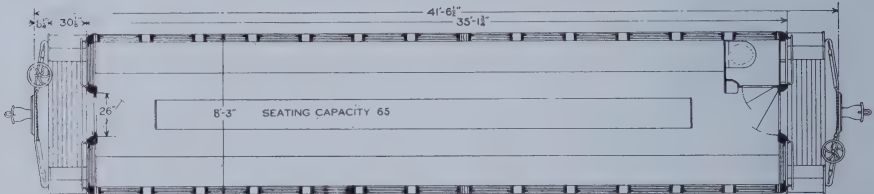


STEAM CARS FOR SOUTH AMERICAN RAILROAD. Interior of third-class type. The three benches provide a seating capacity of 65.



STEAM CARS FOR SOUTH AMERICAN RAILROAD. Seating plan of first-class type. Height, track to side sills, 2 ft. 3 3/8 in.; side sills over roof, 9 ft. 8 1/2 in.; floor to center of headlining, 8 ft. 7 7/8 in.; track to step, 15 11-16 in.; risers, 10 in.; platform to floor, 1 9-16 in.; weight of body, 21,400 lb.; trucks, 11,500 lbs.

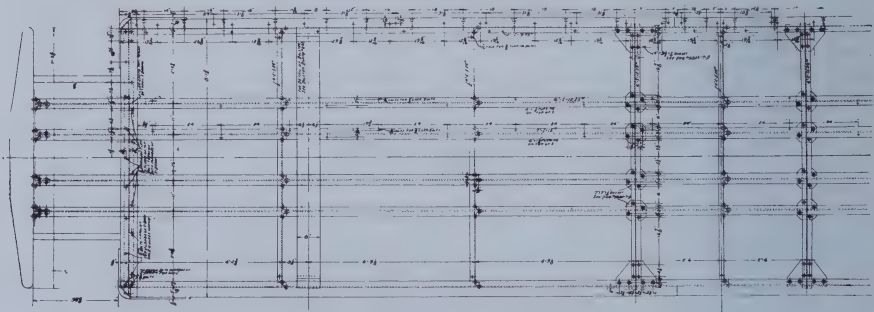
with a central bench without back; for this size of car; they have a the seating capacity is 65. Two wheelbase of 5 ft., 26-in. diameter double center lamps, designed to wheels, 3 3/4 by 7-in. journals, and



STEAM CARS FOR SOUTH AMERICAN RAILROAD. Seating plan of third-class type. Height, track to side sills, 2 ft. 3 3/8 in.; side sills over roof, 9 ft. 2 3/8 in.; floor to center of headlining, 8 ft. 2 7-16 in.; track to step, 15 11-16 in.; risers, 10 in.; platform to floor, 1 9-16 in.; weight of body, 20,000 lbs.; trucks, 11,500 lb.

burn kerosene, are used for both types of cars. are made for a track gage of 3 ft., which is the standard of the system, and which is common to many lines in South America.

Both types are mounted on Wason trucks of standard design



STEAM CARS FOR SOUTH AMERICAN RAILROAD. Design of composite bottomframe used for both first- and third-class cars.

A point to be considered in ordering baggage and freight cars is that, in many instances, a power hoist could be utilized to great advantage as part of the equipment.

New Standard Type of Car Adopted for Salt Lake City

DURING the last two years there has been great activity in electric railway extension and improvement in and around Salt Lake City. The Utah Light & Railway Company controls and operates the street car lines of the city and also lines reaching important towns to the north and south. The rapid growth of Salt Lake City, which has now about 100,000 population, and the immense development of its environs, have been constantly calling for a greater carrying capacity on these lines and the extension of trackage to certain towns and sections where the tributary population is large. In preparation for the operation of longer lines and a greater number of cars on existing lines, a large extension was made to the central power station two years ago, and the peak load capacity of its hydro-electric stations was increased by the construction of equalizing reservoirs. These equalizing reservoirs enabled the company to impound sufficient water to increase its peak load power capacity 50 per cent. without interfering with the continuity of the flow below the stations, required for irrigation purposes. In addition to the furnishing of current for its lines, the company controls practically all of the electric lighting business of the city.

The car illustrated is one of 24 recently put in operation on the lines, and built by the American Car Company. Utmost care in every detail was exercised in the planning of this type, as it has been adopted as the new standard of the railway system, from which it is believed there will be no reason to depart for a considerable period. The wide streets of Salt Lake City permit the operation of a car as long as this (50 ft. over bumpers) and ample prepayment platforms adapt it to heavy traffic; also, the large seating capacity is desirable for the long suburban lines. Weight is reduced by a steel bottom and side construction, in which wide side girders carry the load.

Some of the cars have been placed on the "First South Line," one of the busiest divisions of the system, and extends for about $5\frac{1}{2}$ miles. This line has a grade from 1 to 5 per cent for two-thirds of its length. A number are in operation on the "Second South Line," also a busy line with frequent stops, and is $8\frac{1}{2}$ miles long with a similar grade to the "First South Line." Six cars are equipped with powerful motors for the faster speed required on the "Wandamere Line." This line is $5\frac{1}{2}$ miles long and outside the city has stop signs 1000 ft. apart.

The side girder construction consists of $\frac{1}{8}$ -in. cold rolled patent-

level steel with joints covered both inside and out with $\frac{1}{8}$ -in. splice plates. The upper member of the girder is a 4-in. special bar section weighing 6.7 lb. per foot, and the lower member is a 4 by 4 by $\frac{3}{8}$ to 7-16-in. tee; both top and bottom members extend the full length of

system of diagonal bars (shown in the diagram on page 276) resist deflection from cornerwise strains. A wide $\frac{1}{4}$ -in. steel gusset plate reinforces the center of the end sills and provides an attachment for the center platform knees. The bolsters are cast steel $9\frac{1}{2}$ in. deep at



NEW STANDARD TYPE FOR SALT LAKE CITY. Omission of bulkheads an important factor in weight reduction.

the body. Two steel angles, 2 by $1\frac{1}{2}$ by 3-16 in., are riveted to the side girder plates at each post, to which the posts are bolted. These angles are forged at right angles at the lower end to permit riveting to the stem of the tee. Wide vertical as well as horizontal forged gusset plates secure the 10-in. end sills to the side girder tee, and a

the center. The platforms are supported on side knees of 6-in. channel section weighing 13 lbs. per foot and reinforced at the end sill by 2 by 2 by $\frac{1}{2}$ -in. top and bottom angles. The diagonal platform braces and other members of platform and body not described are shown in the diagram.

Straight-grained ash is used for

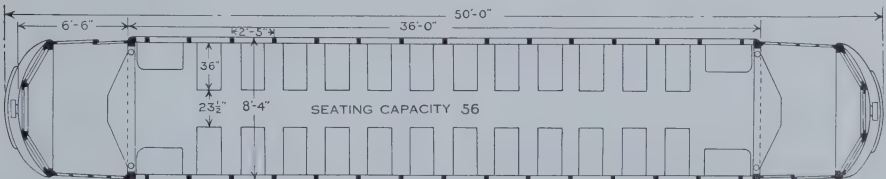


NEW STANDARD TYPE FOR SALT LAKE CITY. Doors on both sides are operated by lever on platform and open outwardly. Mounted on Brill No. 27-G Trucks.

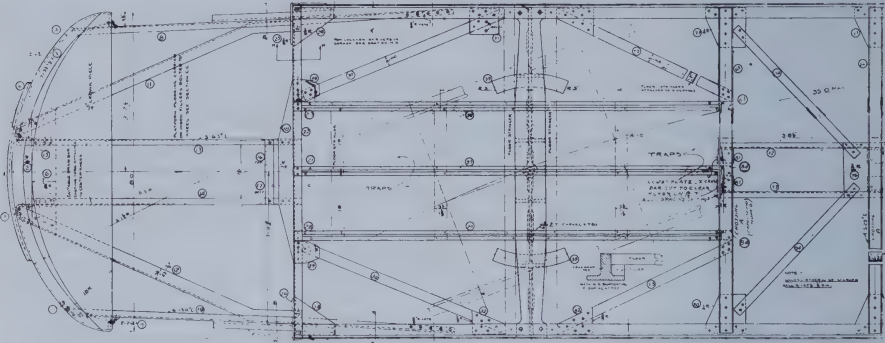
the side posts, which are spaced 2 ft. 5 in. from center to center. The side panel framing consists of two longitudinal members between posts, and the framing piece is set in the posts which are grooved to receive it. The belt rail and framing piece are braced by four ash ribs between each pair of posts, boxed into the belt rail and mortised into the framing piece. A drawn-steel moulding serves for the window sill capping and extends the full length of the car; it is fitted around and flashed to the posts with copper. At the corner posts, and at each alternate side post, are steel earlines, composed of 1 by 1 by $\frac{1}{8}$ -in. angles for the top member, and 3 by $\frac{1}{8}$ -in. plates. A steel earline, $1\frac{1}{2}$ by $\frac{3}{8}$

in., with wood furring on each side, reinforces each hood across the center.

The entrance and exit platform opening is provided with two-leaf doors, glazed in both upper and lower panels, and operated in conjunction with the step by a double-shaft outward-folding device. At the motorman's right-hand side a two-leaf exit door is operated by a single-shaft outward-folding device, to which the step is connected. White enamelled $1\frac{1}{4}$ -in. pipe is used for the six stanchions—four on the platform, and one at each body corner post—shown in the photograph of the interior; in this photograph will also be seen the $\frac{1}{2}$ -in. rod which supports the motorman's curtain. At the center of



NEW STANDARD TYPE FOR SALT LAKE CITY. Height from track to side sills, 2 ft. 10 9-16 in.; side sills over trolley boards, 8 ft. 10 11-16 in.; floor to center of head-lining, 7 ft. 8 in.; track to step, 16 in.; step to platform, 13 in.; platform to floor, 11 in.



NEW STANDARD TYPE FOR SALT LAKE CITY. Plan view of steel bottom frame.

the vestibule is a single-sash window, arranged to drop into a pocket; the windows on each side have stationary upper sashes and lower sashes which drop. The side windows of the car have stationary upper sashes and lower sashes which raise their full height. Five-rod window guards are made in three sections to each side. The inside finish, panels, doors, sash,

etc., are of cherry, with mouldings of sanitary finish. Eight ventilators are installed in the car-body ceiling and one in each hood. The lighting arrangement consists of nine lamps on each side of the car, two along the center of the ceiling, two on each platform, one sign light, and one headlight on each platform, making a total of 28 lights per car.

Steel Combination Cars for the Cumberland & Westernport Lines

Brill No. 27-MCB2X Trucks



THE Cumberland & Westernport Electric Railway is a 27-mile line tributary to Cumberland, and traversing Alleghany County in a south-westerly direction from that city to Westernport, in the southwestern corner of the county on the Potomac River opposite Piedmont, W. Va. The line runs through the fertile and populous George's Creek valley, lying between ranges

of the Allegheny Mountains. The Allegheny Mountains cross this western part of the State of Maryland, dividing it into valleys rich in farm lands and bordered by forests of valuable timber and thickly dotted on the mountain sides with coal mines, and also clay and lime beds, which are worked principally for the production of cement, and for the manufacture of brick, terra-cotta, pottery, etc. The company's cars use the tracks

of the Cumberland Electric Railway from the center of the city to a suburb where its own tracks start and continue up a long grade, passing large coal mining interests, and on to Frostburg, 2,200 feet above sea level. A number of thriving mining towns are along the road, and all the way to Westernport—one and one-half hour's ride—the scenery is magnificent and well worth the trip.

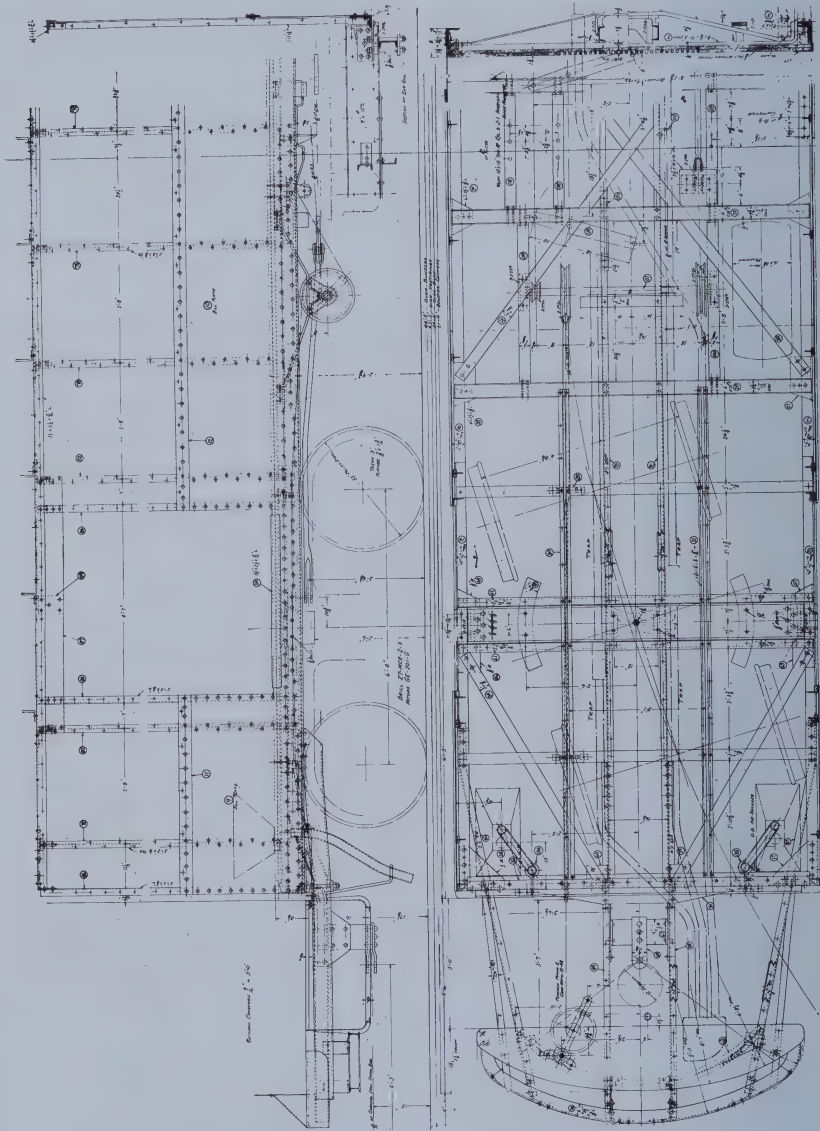
The J. G. Brill Company has lately delivered a number of cars of the type illustrated, which are admirably adopted to the requirements of this interurban system. The excellent track and roadbed of the line enable high speeds to be attained; therefore, the cars are mounted on Brill No. 27-MCB2X trucks, capable of 50 miles per hour. The side girders of the cars are made of 3-16-in. steel plate, reinforced at the bottom by 6 by 3½ by ½-in. angle, and at the top by 3½ by ½-in. bar; 10-in. channel steel is used for the end sills and 4-in. channel for the center stringers and crossings. The outside and

center platform knees are also of 4-in. channel. The diagram on page 278 shows the diagonal bracing at the center of the car and the wide gusset plates at the corners. Built-up bolsters are used, consisting of a top member of 9 by 5⁄8-in. plate, and a bottom plate of 9 by 7⁄8-in. steel. Side posts of steel tee section are riveted to the side plates and to the metal top plate. The rest of the upper structure is of straight-grained ash, with the roof sills and other long members of long-leaf yellow pine. Steel rafters at each post, provided with ash furring strips, and one intermediate ash carline between each pair of posts, support the roof.

The vestibules are of the semi-circular closed type, 4 ft. 6 in. over the sheathing, and fitted with three drop-sash windows. At each side the door opening is provided with the builder's standard type of folding door and stationary step. The passenger compartment windows have stationary upper sashes and lower sashes arranged to raise



COMBINATION CARS FOR CUMBERLAND & WESTERNPORT. Steel girder and tee post construction. Mounted on Brill No. 27-MCB2X Trucks.



COMBINATION CARS FOR CUMBERLAND & WESTERNPORT. Length of body, 34 ft. 3 in.; over vestibules, 43 ft. 3 in.; of platforms, 4 ft. 6 in.; baggage compartment, 8 ft. 11 15-16 in.; passenger compartment, 24 ft. 2 9-16 in.; width over sides, 8 ft. 5 in.; aisle width, 21 in.; height, track to side sills, 2 ft. 9 3/8 in.; side sills over trolley boards, 9 ft. 2 1/4 in.; track to step, 17 1/8 in.; step to platform, 16 in.; platform to floor, 8 1/4 in.; weight of body, including electric and air equipment, 27,000 lbs.; trucks, 14,900 lbs.

their full height. Seven-rod win- side, afford protection when the
dow guards, in two sections to each sashes are raised. This compart-

ment seats 36 passengers, 14 of the seats being transverse, and longitudinal seats for four passengers each at the end next the platform. In the baggage compartment, the sliding doors on each side are four feet wide, and the glass in the upper part is protected by iron rods. Stationary longitudinal seats with

giving a total seating capacity for the car of 48.

Cherry is used for the interior finish and for the doors and sashes. Electric push buttons are installed in each window post in the passenger compartment and one on each platform. Among the Brill specialties with which the cars are



COMBINATION CARS FOR CUMBERLAND & WESTERNPORT. Sliding doors are 4 ft. wide. Seats accommodate 12 passengers; main compartment seats 36.

spring rattan cushions occupy the space between the door and the car corner on each side, and seat three passengers each; slat benches, which fold against the partition, fill the space in back of the sliding doors, and seat three passengers on each side: the seating capacity of this compartment is therefore 12,

equipped are radial drawbars, angle-iron bumpers, platform gongs, signal bells and door-operating mechanisms. The Brill No. 27-MCB2X trucks have a wheel-base of 6 ft. 4 in.; 33-in. diameter wheels; $4\frac{1}{4}$ by 8-in. journals, and are equipped with 60 hp. motors, four to a car.

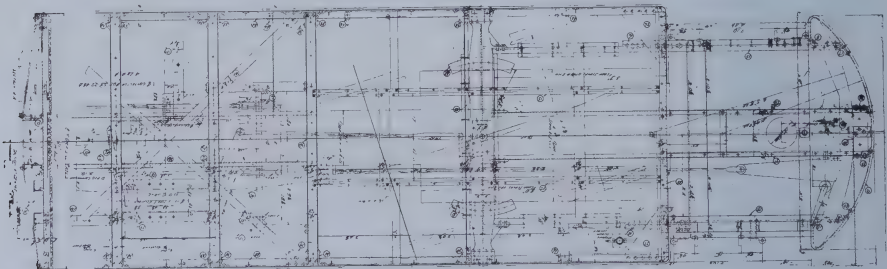
Steel Cars for Altoona & Logan Valley Electric Railway

City and Suburban Types

AN interesting lot of steel cars recently shipped by The J. G. Brill Company to the Altoona & Logan Valley Electric Railway Company, Altoona, Pa., consisted of five 28-ft. prepayment city cars, mounted on Brill No. 39-E single-motor trucks, and four 32-ft. 6-in. prepayment cars, mounted on Brill No. 27-MCB1 high-speed trucks, for light interurban service. The Altoona & Logan Valley Electric Railway is controlled by the American Railways Company, Philadelphia, and operates the city systems as well as the connecting lines of Tyrone, Bellwood, Altoona and Hollidaysburg, in south central Pennsylvania. In addition to its own lines, the company also controls the Home Electric Light & Heating Company, Tyrone, Pa., the Logan Land Company and the

Lakemont Park Company. Its equipment consists of some 87 passenger motor cars and 28 cars of miscellaneous types, in addition to the cars recently purchased. Altoona is the largest of the four cities in which the company operates, having a population of 52,000, and the interurban division of the system extends in a northeasterly direction from this city through Bellwood to Tyrone, and in the opposite direction from Altoona to Hollidaysburg.

The construction of both the city and the suburban cars is practically along the same lines. The underframe of the suburban cars is illustrated by the diagram on page 283, and with the exception of the length of the members and the width of the steel girder plate extending along each side of the carbody, it is the same as the underframe used under the city



CARS FOR ALTOONA & LOGAN VALLEY. Diagram of suburban car bottomframe. Steel side girder, 31 in. wide and 3-16 in. thick, is spliced at the corner post but continues around to the bulkhead door post. The bottomframe of city cars is practically the same.



CARS FOR ALTOONA & LOGAN VALLEY. Suburban car equipped for prepayment method of fare collection. Mounted on Brill No. 27-MCB1 Trucks.

cars. The side sills are 5 by 3 by $\frac{3}{8}$ -in. angle riveted to the end sills, which are of the same dimensions; a steel girder, 31 in. wide and 3-16 in. thick, extends above the side sills; it is spliced at the corner post, but continues around to the bulkhead door post, being reinforced at the top by a continuous $3\frac{1}{2}$ by $\frac{5}{8}$ -in. bar. All crossings are of 4-in. $5\frac{1}{4}$ -lb. channels, and the diagonal braces are 3 by $\frac{3}{8}$ -in. steel bars. The platforms

are supported on 7-in. $9\frac{1}{4}$ -lb. channels, which extend back under the end sill to the body bolster; the two outer knees are reinforced by steel plates at the corner posts.

An important feature of the upper frame construction is the tee-post construction. The side posts consist of 2 by 2 by $\frac{1}{4}$ -in. tees, extending from side sill to side sill, thereby serving also as earlines; these posts are riveted to the steel girder plate and to the angle side



CARS FOR ALTOONA AND LOGAN VALLEY. City Car. Mounted on Brill No. 39-E Trucks. Upper sashes in both types framed in one piece.

sill on each side. White oak is used as post fillers, to which the interior finish is attached.

Both types of cars have 6-ft. platforms, arranged for prepayment operation with pipe railings and are equipped for double-end operation, each platform having an entrance and an exit side. En-

closed by a single two-leaf folding door operated from the motor-man's position. All doors are operated in conjunction with the folding step, and are paneled with wired glass. The vestibule sashes drop into pockets, and are arranged to be held at desired heights. All side sashes are in two



CARS FOR ALTOONA & LOGAN VALLEY. Suburban cars are combination type. Smoking compartment equipped with slat seats accommodating 12; main compartment seats 36.

trance is always by way of the rear platforms, the exit door on the opposite side being locked, and vice versa on the front platform. The entrance openings are enclosed with two double-leaf folding doors operated by a lever on the platform; the exit openings are en-

closed by a single two-leaf folding door operated from the motor-man's position. All doors are operated in conjunction with the folding step, and are paneled with wired glass. The vestibule sashes drop into pockets, and are arranged to be held at desired heights. All side sashes are in two

pocket as desired. The interiors of the cars are finished in mahogany, and push buttons are located on all side posts.

The suburban cars have a partition separating them into main and smoking compartments; they are built with the plain-arch type

the installation of a stove during the winter. The seats in the main compartment accommodate 36 passengers.

The city cars are equipped with plain arch roofs, but the hood at each end, as will be noted in the illustration, is not flush with the



CARS FOR ALTOONA AND LOGAN VALLEY. Omission of bulkheads in city cars reduces weight. Seating capacity, 44.

of roof. The smoking compartment occupies the space of three windows and has a 26-in. sliding door in the partition. Longitudinal mahogany slat seats on both sides of the compartment provide seating accommodations for 12; a section of one seat is removable for

carbody roof, necessitating a transom which is equipped with a ventilator. Seven transverse seats of the mahogany slat type are located on each side of the aisle, and together, with the longitudinal corner seats at each end, provide a seating capacity of 44.

Single-Truck Type for Keokuk, Iowa

Steel Underframe

THE Keokuk Electric Company, which practically controls the electric railway, electric lighting, electric motor and the gas interests in the cities of Keokuk, Iowa, and Hamilton and Warsaw, Ills., besides

in two parts to a side and are made of 5-32-in. steel, with a $2\frac{1}{2}$ by $\frac{3}{8}$ -in. steel dropper bar at the top, and a $3\frac{1}{2}$ by $2\frac{1}{2}$ by $\frac{1}{2}$ -in. angle at the bottom. A $1\frac{3}{4}$ by $\frac{3}{8}$ -in. oak member is bolted on top of the sill angle and mortised to receive the posts. The end sills are made

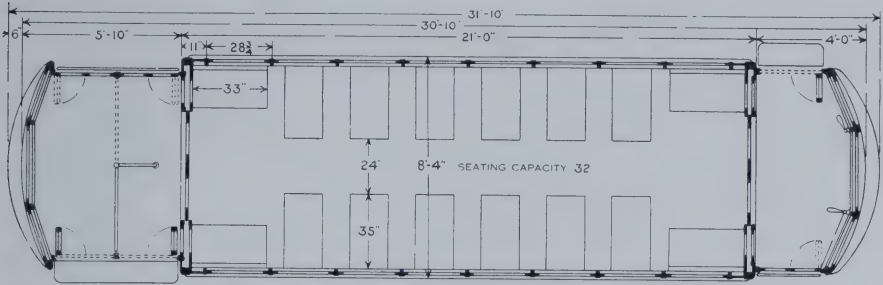


SINGLE-TRUCK TYPE FOR KEOKUK, IOWA. Rear platform arranged for prepayment method of fare collection. Upper sashes framed in one piece, extending from corner post to corner post.

operating an interurban line between these cities, recently purchased the type of car illustrated from the American Car Company. The city of Keokuk is situated in the extreme southeast corner of the State, having a population of some 14,000, and is situated on the Mississippi River.

This type of car is unusually interesting, as it includes the steel side girder construction rarely found in carbodies under 28 feet in length. The girder plates are

of angles, 6 by 5 by $\frac{1}{4}$ in., with $3\frac{1}{2}$ by 10-in. oak bolted thereto. The cross sills are $5\frac{1}{2}$ -in. I-beams, gusseted to the sides by means of 3-16-in. steel. The truck sills are of yellow pine, reinforced by 3 by 3 by $\frac{3}{8}$ -in. steel angles at the end sills. A substantial platform construction is used, which consists of 7 by $3\frac{1}{2}$ by $\frac{3}{8}$ -in. angle outside knees with reinforcing angles of 2 by $2\frac{1}{2}$ by 5-16 in. and 42 in. long at the rear platform only. Other details of the bottomframe are

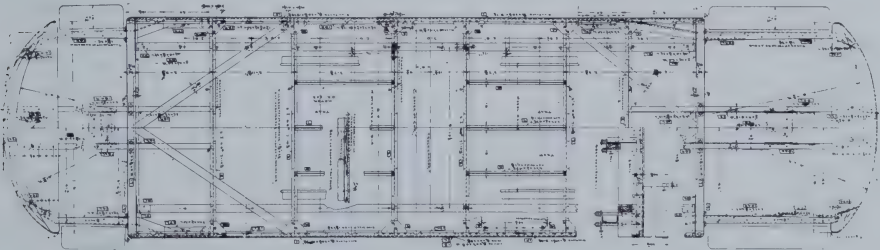


SINGLE-TRACK TYPE FOR KEOKUK, IOWA. Height, track to side sills, 2 ft. 3½ in.; side sills over trolley boards, 8 ft. 7¼ in.; floor to center of headlining, 7 ft. 10 in.; track to step, 15½ in.; step to platform, 14 in.; platform to floor, 9 in.

shown on the accompanying diagram. The side posts are of light construction, with the upper windows framed with continuous members. The roof has the usual reinforcement of steel carlines.

While this type of car is designed for single-end operation chiefly, both platforms are equipped with controllers and brake arrangements and the seats have reversible backs. The platform at one end is 5 ft. 10 in. long, and is provided with a railing for separating incoming and outgoing passengers. The doors on each side of this platform are alike, and are of the two-leaf type, which fold inwardly at either side of the open-

ing. A stanchion is located at the center of the platform and the step is in one piece and hinged to fold up, but does not operate in conjunction with the doors. The platform at the other end is 4 ft. long and has no dividing railing. The doors at each side are of the two-leaf type and fold against the vestibule corner post; the steps at this end operate with the doors. Mutually operating sliding doors are at each end of the body. The lower window sashes raise to give a 26-in. clearance. Six transverse seats on each side, with corner seats for two passengers, have slat seats and backs, and furnish a total seating capacity of 32.



SINGLE-TRACK TYPE FOR KEOKUK, IOWA. Diagram of interesting method of bottomframe construction. Includes steel side girders rarely found in cars of this length.

SUGGESTIVE SUBJECTS

NOTE.—The purpose of these last pages is to supply executive officers with material suggestions—ideas that may prove useful in preparing their printed matter and placards, also pay-envelope stuffers, magazine material for employees, heart-to-heart talks in letters and literature. For such purposes the copyright is waived.

When it is said of a railway employe that he is “always on the job,” it usually means a great deal more than that he has punctual and steady habits.

It is an expression that is commonly applied to a man who does his work extra well and is always alert in thought and action.

The man who is constantly thinking of what he is doing and watching what is coming next gets a reputation, has it said of him that he is a fellow who is “always on the job.”

Such a man never chafes under rules—he puts himself under much more strict rules than the company makes.

He doesn't need to straighten up and look busy when the boss comes around—he is always that way and the boss soon knows it.

He looks “professional” whatever his job is because his mind and his motions work freely and quickly together.

He quickly becomes a complete master of his work and then adds to his knowledge accurate information on everything relating to it.

While he has plenty of ambition, it is tempered with unflagging patience and perseverance and will therefore get him to his goal.

An added responsibility doesn't rattle him, for he is used to looking at his whole job as a big responsibility to be carried squarely on his own shoulders.

He is in training for the bigger responsibility that is coming his way when he is up to it, because he thinks, because he drives himself, because he is “always on the job.”

Some Newly Worded Warnings

FROM the time you start to leave the car till you reach the sidewalk never stop looking for danger.

Don't hesitate in front of a car, it confuses the motorman. Go forward or back in a decided manner.

When you stop to think be sure to stop in a safe place.

Get in and out of a car quickly, but don't hurry—hurrying is dangerous and sometimes fatal.

Don't let a child under eight cross a trolley car street alone.

If you don't warn and take care, your child may be maimed or killed, no matter how much we warn and take care.

Double your watchfulness when you cross a double-track street.

Selecting Employees

THE success of an electric railway company depends to a large extent on the fitness of its employes to their work. The selection of employes from the standpoint of fitness is therefore one of the important fundamentals of the whole organization. A man may be sound in mind and body, yet unsuited to the job for which he applies. To guard against misfits, a man should not be accepted on his good appearance and statements, nor even on a satisfactory recommendation, if it is at all possible to arrange for a sufficient trial to show whether he is actually experienced, or, if experience is unnecessary, to show whether he has aptitude. If enough thought and care are given to eliminating doubts of a man's fitness to a job before he is employed, much time, trouble and money will be saved and the organization will be strengthened by this process of exclusion.

Public Relations

IF the chief executive of an electric railway should publish his own public relations creed over his signature, giving it and similar statements ample and continued publicity, he would do more towards deepening the foundations of respect, confidence and co-operation than could be accomplished by all other publicity combined. The public realizes that the spirit which actuates the head of the company influences the entire organization. Real faith demands a dominating personality and the chief executive is the one to take the responsibility, commit himself frankly and fully to the highest standards of public service, live up to them and enforce them.

Car Card Talks to Passengers

CONSIDER the motorman. It takes skill and experience to start and stop the car smoothly, to gage distances, to sound the warning gong at the right times, to hear signals no matter what is claiming the attention, to work in harmony with the conductor at all times, to watch the track for possible obstructions, to keep an eye on the trolley wire for a possible break, to sense what drivers of horses and quickly moving automobiles will do under various circumstances, to keep a sharp lookout for unexpected movements of children and adults at and between crossings, to be ready to warn or help thoughtless or preoccupied passengers entering or leaving at the front platform. Dim light, bad weather, and especially slippery rails, complicate things. Judgment and action must meet every situation without a second's hesitation—every trip has its series of more or less difficult situations. The weight of the car and its powerful motors give it great momentum, and, although controlled and guarded by the safest and most efficient means, it depends on the motorman and you to prevent an accident. A responsible man is running this car—only such are selected for such responsible work—you can rely on him to do his part.

Advertising in September Magazines

A CHANGE was made in the advertising program for August outlined in the last issue of BRILL MAGAZINE. Instead of a series on the subject of snow sweepers and plows in the *Electric Railway Journal*, the Radiax truck series of July was continued. Sweepers and plows will be featured this month, and will be followed by a series on trailer trucks. The Radiax truck will be shown in the September *Electric Traction*, and a snow sweeper in the *Street Railway Bulletin*. Special illustrations will be prepared for these issues as usual.

Changes of Address

THOSE who receive BRILL MAGAZINE are requested to send in any change of address at the earliest opportunity. It will be more convenient in making up the mailing list if the new address is written on the envelope in which the magazine is received. Send to the Publicity Department, The J. G. Brill Company.



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Brill Standard Snow Sweeper

THE Brill Standard Snow Sweeper has endurance and efficiency records in the cities of our Northern States, Canada and Northern Europe. It is built the same today as ten years ago. There has been no call to change any part—not a replacement order has been received in all this time for anything but the wear parts, such as sprocket wheels and sprocket chains. On heavy traffic lines like New York and Montreal, the machine has been used for years because it works fast and is dependable. Write for Catalogue No. 183.

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